1. Purpose of the Conference

The current conference, *The Health Impact of Chemical Exposures During the Gulf War: A Research Planning Conference,* is convened, under the support specified by House Report 105-205[1], to obtain broad public input into the development of a multi-year research plan investigating relationships of chemical exposures to illnesses among Gulf War veterans (Eisenberg, 1998).

House Report 105-205 provided funding to the Office of the Secretary, Department of Health and Human Services (DHHS) to support research in the areas of:

- "multiple chemical sensitivity";
- "genetic differences in the ability to metabolize environmental agents commonly encountered during the Persian Gulf";
- "how multiple exposures of chemicals interact to exert their toxicity on an organism"; and
- "treatment protocols which are being developed in the public and private sectors for illnesses resulting from chemical and other environmental exposures" (Eisenberg, 1998).

The plan is to be developed without duplicating existing research efforts contained within the research plans of the Research Working Group (RWG) of the Persian Gulf Veterans Coordinating Board (PGVCB) (Eisenberg, 1998).

2. The Gulf War: Overview

Shortly after Iraqi armed forces invaded Kuwait on August 2, 1990, Coalition troops (i.e., troops from the United States [U.S.], United Kingdom [U.K.], Canada, France, Saudi Arabia, Egypt, Syria and other countries) began deployment in Operation Desert Shield. Within two months, 200,000 U.S. troops had been added to those already in the Gulf area. Beginning on January 16, 1991, air attacks against the Iraqi army opened the phase of operations known as Operation Desert Storm (IOM, 1996b). The first oil well fires were started in Kuwait by the Iraqis on January 20, 1991 and the majority of oil well fires had been started by February 19, 1991 (Spektor, 1998; DoD, 1998e; PAC, 1996b). By February, 1991, more than 500,000 U.S. troops were in the field facing the Iraqi armed forces. Operation Desert Storm ended after a brief ground war from February 24 to February 28. U.S. troops were removed quickly from the area, and by June, 1991, fewer than 50,000 U.S. troops remained. A total of approximately 697,000 U.S. military men and women served in Operations Desert Shield and Desert Storm in 1990 and 1991 (Joseph et al., 1997). During the war, deaths among U.S. troops were restricted to 148 combat deaths and 145 deaths due to disease or unintentional injuries; only 467 additional individuals among U.S. troops sustained injuries (PAC, 1996b). It was well known that Iraq had chemical and biological warfare capabilities, but several review panels have concluded that there is no convincing evidence that Iraq used chemical or biological warfare agents against U.S. troops (DSB, 1994; NIH, 1994a,b; IOM, 1996b; PAC, 1996a,b; 1997; see Appendix A: *Account of Events Related to Health Concerns of Gulf War Veterans*). The Department of Defense (DoD)

[1] House Report 105-205 accompanied the 1998 U.S. House of Representatives Appropriations Bill for the Departments of Labor, Health and Human Services, and Education and Related Agencies.

released information in June 1996 that, in March 1991, U.S. forces demolished Iraqi weapon-storage sites in the Khamisiyah region. After the demolition, the sites were determined to have contained chemical warfare agents (e.g., the nerve agents, sarin and cyclosarin), thus indicating the possibility that certain U.S. troops may have been exposed for short periods of time to low levels of nerve agents (see Appendix B: *Exposure to Chemicals During the Gulf War*).

Upon return from the Gulf War, some U.S. veterans reported an array of general symptoms of ill health including fatigue, skin rash, headache, muscle and joint pain, memory disturbance, concentration difficulties and memory loss, shortness of breath, sleep disturbances, and diarrhea. Health concerns among some veterans still persist in 1999.

Various review panels have concluded that no single cause has been established for these symptoms of ill health (DSB, 1994; NIH, 1994a,b; IOM, 1996b; PAC, 1996a,b; 1997; U.S. Senate, 1998), but several potential explanations have been proposed including: possible exposure to low levels of chemical or biological warfare agents; use of pyridostigmine bromide pills to protect against chemical warfare nerve agents; exposure to airborne sand particles and/or oil-well fire smoke; exposure to mixtures of pesticides, insect repellents, and other chemicals; anthrax and botulinum toxoid vaccines; infectious diseases; depleted uranium; and physiological and psychological stress (see Appendix B: *Exposure to Chemicals During the Gulf War* for more details).

3. Illnesses Among Gulf War Veterans

The Department of Veterans' Affairs Persian Gulf Health Registry and the Department of Defense Comprehensive Clinical Evaluation Program

Health registries for U.S. Gulf War veterans were established in 1992 by the Department of Veterans' Affairs (DVA), the Persian Gulf Health Registry (PGHR), and in 1994 by the DoD, the Comprehensive Clinical Evaluation Program (CCEP). These programs were established to gather information from veterans regarding their wartime exposures and health histories and to offer veterans the opportunity to have comprehensive physical and laboratory examinations of their health. Veterans who choose to participate are clinically examined (including laboratory analysis of blood and urine samples) and administered a questionnaire regarding medical and family history, symptoms, recent debilitating illnesses, and self-perceived wartime exposures to specific risk factors (e.g., combat and specific chemicals) (Joseph et al., 1997; PGVCB, 1995).

Participation in these health registries is voluntary. The registries provide useful information to describe the health status of participants, but general prevalence rates of illnesses among Gulf War veterans cannot be assessed because participants are self-selected and do not constitute a representative sample of all U.S. soldiers who served in the Gulf region. Furthermore, no control group is available for comparison of rates of illness.